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Abbreviations for compartmented codewords are:
M—MORAY S—SPOKE U—UMBRA G—GAMMA

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Proliferation Digest [redacted]

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China's Nuclear Bureaucracy and Export Controls: Uneven Enforcement [redacted] 17

[redacted]

In the wake of repeated US protests over China's nuclear assistance to Pakistan and Iran, Chinese Government authorities are taking steps to more closely monitor all types of nuclear-related transfers and assistance. Senior political leaders probably will continue to decide on major nuclear deals that come to their attention, irrespective of the new measures, but the steps may signal a new determination to address significant administrative shortcomings in China's export-control system. [redacted]

Possible Future Activities at China's Nuclear Test Site [redacted] 23

[redacted]

Although China is observing a moratorium on nuclear testing, we expect that it will continue to conduct at least some test-site activities to monitor the condition of its nuclear stockpile. If China proceeds with earlier plans to conduct "simulated underground nuclear tests," which may produce a small nuclear yield, Russian-supplied diagnostics equipment would help the Chinese collect more valuable data. Tests with yields on the order of 100 tons would not be detected seismically, even if there were no attempt at evasion. Tests with yields of several kilotons would also be undetectable if conducted in large cavities. [redacted]

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China's Nuclear Bureaucracy and Export Controls: Uneven Enforcement [redacted]

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[redacted]

Intensifying Oversight of Nuclear Exports [redacted]

[redacted] admit that current controls over nuclear exports are administered through so-called "in-house" regulations, although these have not been publicly disseminated. In contrast, the State Council passed regulations governing chemical exports that were published in the Chinese Communist Party's newspaper, *People's Daily*, in January 1996. [redacted]

[3] CNNC—created in 1988 to oversee civilian applications of nuclear technology—ostensibly integrates more than 200 state enterprises and some 300,000 people engaged in research, development, production, consulting, and foreign trade. Plutonium production reactors and uranium enrichment plants—which produce fissile material for the military—are also under the auspices of the CNNC, according to diplomatic and defense attache reporting. [redacted]

[redacted]

Premier Li Peng awarding Deng Jiaxian, the former Director of CAEP, the National Labour Medal of "May Day." [redacted]

Chinese Nuclear Exports Meeting International Standards? [redacted]

[redacted]

[redacted] *In cooperation with other countries since signing the Nuclear Non-Proliferation Treaty in 1992, however, China or its trading partner has informed the IAEA of the majority of relevant nuclear transfers and followed IAEA guidelines in placing equipment and material under safeguards.* [redacted]

Highly Sensitive Nuclear Transfers Require Senior-Level Approval [redacted]

The new directives to report nuclear export activity to the Foreign Ministry and State Council probably will not change China's decisionmaking process for major nuclear exports. Senior Chinese Government leaders probably will continue to be the final arbiters for such deals:

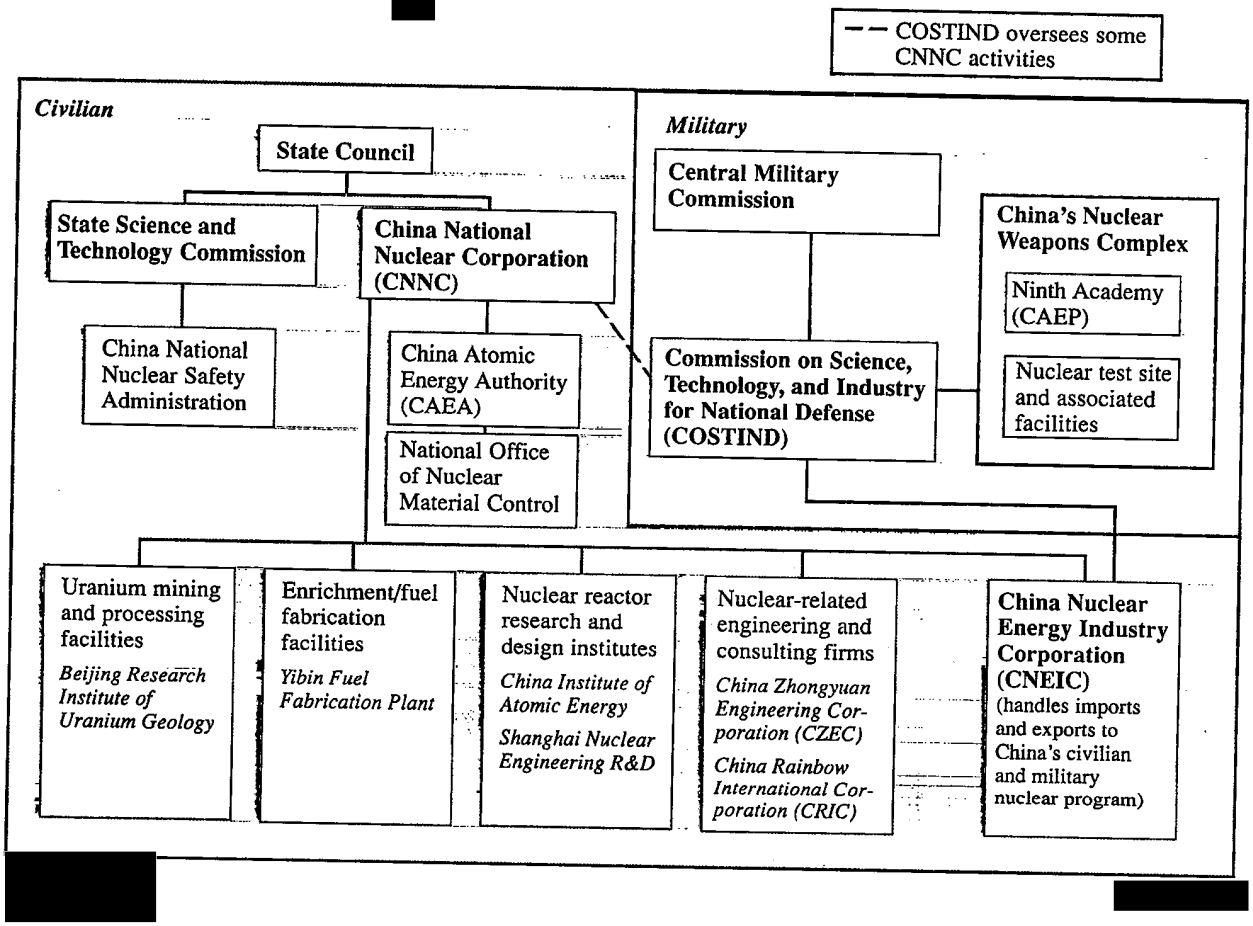
- In his remarks to US officials in October, the former CNNC official said that senior Chinese Government officials (probably in the State Council) would decide whether or not to approve CNNC's proposal to cancel the sale of a uranium conversion facility to Iran.

[redacted]

Decisionmaking Process on Less Sensitive Transfers Still Unclear [redacted]

Although the new measures may not affect decisionmaking on major nuclear deals, a more visible role by the Foreign Ministry and State Council in reviewing all applications to export nuclear items could signal a new determination to address significant administrative shortcomings in China's export control system. Various reports indicate that China's export-control bureaucracy—which includes the China Atomic Energy Authority (CAEA) and the International Cooperation Bureau (ICB)—has been only marginally effective in monitoring nuclear-related transfers that do not reach the attention of Beijing's senior leadership.[4] In April 1996, CAEA Vice Chairman Chen Zhaobo told a defense attache that China has very strict rules on the sale of prohibited nuclear material and that, as a vice chairman, he must clear any sale of "sensitive material." [redacted]

China's Nuclear Bureaucracy [redacted]



[redacted]

as power plants. Some transfers may occur without knowledge of CNNC or its subordinate, CAEA, let alone Beijing's senior leadership:

[redacted]

[redacted]

Nuclear Industry in Flux [redacted]

Changes within the nuclear industry have been complicating China's efforts to develop workable oversight mechanisms. As the industry has shifted toward production for civilian applications and the marketing of dual-use technologies, lines of subordination within and between the civilian and military nuclear sectors have shifted and have not been fully delineated. We

[redacted]

[redacted]

[redacted]

have no evidence of a central group to coordinate the interests of the various military and commercial bureaucracies involved in nuclear-related trade:

[redacted]

Reluctance To Move Beyond NPT [redacted]

At the core of China's murky oversight bureaucracy is the leadership's continuing reluctance—despite Beijing's accession to the NPT—to move fully into the international nuclear export-control regime by joining the NPT-related Zangger Committee or the Nuclear Suppliers Group:[6]

- By not participating in these regimes, China has avoided the requirement to develop a legal framework to control its increasing number of dual-use exports of nuclear-related technology.
- China's uncommitted status also provides its leaders with maximum flexibility in choosing their nuclear customers and allows them to claim that China is not part of a "Western monopoly." [redacted]

The Profit Motive Further Hinders Export Control (U)

[redacted]

China's nuclear-weapons-related entities, particularly CAEP, also are facing cutbacks and increasingly are turning to sales of civilian products:

- CAEP's gross civilian-related output value was 312 million yuan in 1995, resulting in profits of 40 million yuan (approximately $5 million US dollars) before taxes, according to Chinese open-source publications.
- One CAEP-subordinate institute had half its staff reassigned to commercial activities—which now account for 50 percent of its salaries—because of shrinking budgets. [redacted]

Looking Ahead: Obstacles to Export Reform [redacted]

Several obstacles hinder the development of China's nuclear oversight and export controls, but change in

[6] The NSG guidelines have two parts: the first establishes controls on specially designed nuclear-use items and is currently identical to the Zangger list; the second part, established in March 1992, controls nuclear-related dual-use items. [redacted]

CNNC Nuclear Trading Firms [redacted]

China Nuclear Energy Industry Corporation (CNEIC). *Until the late 1980s, CNEIC was responsible for marketing almost all of China's nuclear exports, including raw materials such as natural uranium and uranium concentrate. The firm is now involved in most of China's overseas nuclear projects and also procures nuclear-related technologies for China's nuclear weapons complex, thus maintaining ties to both the civilian and military sectors of China's nuclear industry. In 1991, CNEIC expanded its operations to nonnuclear items and has incorporated at least two US-based subsidiaries.* [redacted]

[redacted]

China Rainbow International Corporation (CRIC). *This entity previously known as the China Rainbow Development Corporation—is a joint venture between CNNC and the China Nonferrous Metals Corporation created in 1985. It is a consulting firm that negotiates the provision of foreign projects on behalf of numerous Chinese organizations, not all of which are nuclear related.* [redacted]

[redacted]

some or all of the following areas would indicate that Beijing is committed to effective monitoring of nuclear technology exports:

- *Legal framework.* China's export-control system would benefit from a legal framework that clarified its export regulations and provided authority to its enforcement bureaucracy. Since September 1994, CAEA representatives have claimed to US diplomatic officers that they are drafting national legislation on nuclear exports. Should the Chinese Government opt for more effective controls, we would expect to see China move forward with CAEA's draft legislation.
- *Lines of authority.* China's system would benefit from formalized communication between various senior Chinese officials on the State Council and Central Military Commission and representatives from such key nuclear-related entities as CNNC and CAEP.

[redacted]

- *Conflict of interest.* Effective controls depend on minimizing the "conflict-of-interest" situations that exist in China's export-control system. The multiple roles played by Chinese nuclear officials—serving simultaneously trading firms and regulatory bodies—raise questions about objectivity in providing oversight. The President of CNNC, for example, serves as one of the deputy directors on the State Council Leading Group for Nuclear Power Plants, which contributes to decisionmaking on major nuclear exports. Zhou Yuanquan, head of ICB, is also the president of CNEIC.

- *Outreach programs to China's nuclear industry.* Effective implementation of the national nuclear export controls that CAEA is drafting depends on Beijing's commitment to educating export firms about new laws.

- *Willingness to accept additional international obligations.* In meetings with US diplomatic officials in 1996, Chinese nuclear industry officials showed interest but expressed no firm commitment to join the Nuclear Suppliers Group or Zangger Committee.

[redacted]

Possible Future Activities at China's Nuclear Test Site [redacted]

Although China is observing a moratorium on nuclear testing, we expect that it will continue to conduct at least some test-site activities to monitor the condition of its nuclear stockpile. China's moratorium may not restrict test-site activities to the same degree as would a test ban treaty. If China proceeds with earlier plans to conduct "simulated underground nuclear tests," which may produce a small nuclear yield, Russian-supplied diagnostics equipment would help the Chinese collect more valuable data. Data from such tests could allow China to monitor its current weapons stockpile. If the yields are as high as 100 tons or more, China also may be able to explore new warhead design concepts, but China probably would consider full-yield tests a requirement before incorporating a new weapon into the stockpile. Tests with yields on the order of 100 tons would not be detected seismically, even if there were no attempt at evasion. [redacted]

Future Missions for the Lop Nur Test Site (U)

Chinese treaty negotiators in Geneva, expressing positions similar to those of other declared nuclear powers, have stated that China will use its nuclear test site to evaluate the safety and reliability of its nuclear weapons. China did not identify the activities that would be permitted under its moratorium on nuclear testing, but we assume that the moratorium will allow China's nuclear weapons community at least as much freedom to define "permitted activities" as a test ban treaty. If nuclear tests or experiments are conducted at yields lower than our seismic detection threshold, imagery and other observables alone would not provide conclusive evidence of a nuclear test. [redacted]

China has continued to prepare for future activities at the Lop Nur nuclear test site throughout the negotiations for the CTBT:

[redacted]

There are some indications that China may still proceed with previously planned activities in spite of the current moratorium. China's definition of "simulation" might not rule out experiments with very low yields:

[redacted]

Enhanced Test-Diagnostics Capabilities [redacted]

Over the past 3 to 4 years, Russia has exported to China modeling codes, scientific data on how materials react to the pressures and temperatures associated

[redacted]

Low-Yield Nuclear Tests and Zero-Yield Experiments [redacted]

China could achieve a variety of goals, depending on the size of the nuclear releases of it would allow under its moratorium. Any or all of the following activities could be conducted without seismic detection:

- ***Hydrodynamic tests,*** *which are conducted without plutonium or weapons-grade uranium, are used to test high-explosive implosion systems without producing a nuclear yield. The fissile material is removed from the pit of the warhead and replaced by a simulator, such as natural uranium, depleted uranium, or some other dense metal.*
- ***Subcritical tests*** *use fissile materials but are designed not to produce a self-sustaining nuclear chain reaction. Thus, there is almost no nuclear release. Such tests provide data on the properties of metals (such as plutonium) under conditions of high temperature and pressure.*
- ***Hydronuclear tests*** *achieve critical mass, but are designed so that the nuclear yield is much smaller than the high-explosive yield (on the order of pounds or less). Such tests might validate safety upgrades to proven designs, but they could not validate fundmentally new or drastically modifed designs.*
- ***Subkiloton nuclear tests*** *may or may not fall within the Chinese definition of "simulation." Such tests could be used to both validate warhead reliability and explore new weapons designs. Yields up to a few hundred tons would not be detected seismically, even if there is no attempt at evasion. Some tests in this category might be conducted in a reusable facility.*
- ***Yields up to several kilotons*** *would allow China to test most primaries at full yield. Such tests might be concealed by large underground cavities, which could reduce the seismic signal below our detection threshold. Such tests would be too powerful for a reusable facility, but could be conducted in existing underground cavities.* [redacted]

with a nuclear explosion, and diagnostics equipment, such as high-speed oscilloscopes, that will enable China to collect more valuable data from any future tests or experiments. The equipment could be used for collecting data from full-scale nuclear tests, but could also be used for simulation experiments that produce little or no nuclear yield:

[redacted]

[redacted]

Implications [redacted]

The materiel acquired from Russia, which probably is more advanced than Chinese equipment, could provide more detailed information needed for

maintaining China's current weapons stockpile under a test moratorium. Nonetheless, the enhanced diagnostics capabilitites probably could not significantly advance new warhead design and development. [redacted]

Most weapon states have acknowledged that good diagnostics data from hydronuclear tests—which produce yields on the order of pounds or less—is sufficient to monitor an aging nuclear weapons stockpile with the aid of computer codes,[1] but only if benchmark data from full-scale testing of the weapons systems already exist for comparison:

- China may have enough benchmark data from past full-scale testing to be able to use hydronuclear tests and computer codes to monitor its *current weapons stockpile*—which is based on older designs—and validate some safety upgrades to proven designs.[2]

[1] Computer codes can simulate the essential features of weapon design and the phenomena associated with explosions, but simulations do not yet provide the confidence of actual testing. China, moreover, currently has only limited capabilities in computer modeling. [redacted]

[2] Hydronuclear tests could be used to validate some safety upgrades to proven designs, but tests of 100-ton yields or more would provide more confidence. [redacted]

- Given the increased sophistication of China's latest test series, however, and the small number of tests it has conducted to prepare for a test ban treaty, it is doubtful that China has enough benchmark data to enable it to use hydronuclear tests and computer codes alone to monitor *weapons under development,* which would be based on the devices tested most recently. In the absence of full-scale testing, China almost certainly will continue to pursue improved computer simulation capabilities. The Chinese also have the option of rebuilding certain warhead systems before their aging becomes a factor. [redacted]

Even with the new diagnostics capabilites, tests with yields on the order of 100 tons or more would be necessary to explore new warhead design concepts. China, moreover, probably would consider full-yield tests a requirement at some point before incorporating a weapon based on an untested design into the stockpile—if only to acquire benchmark data for future monitoring. [redacted]

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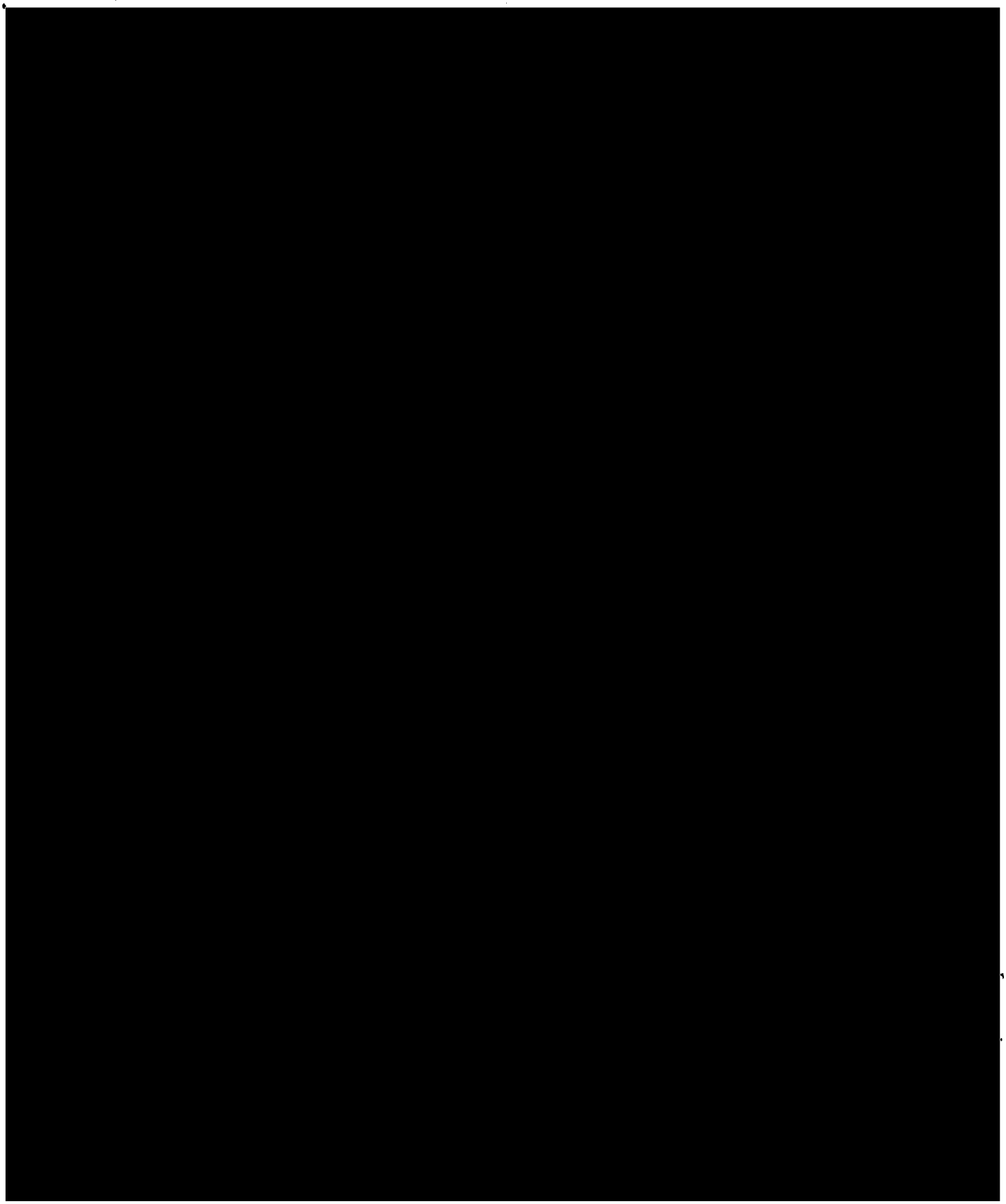

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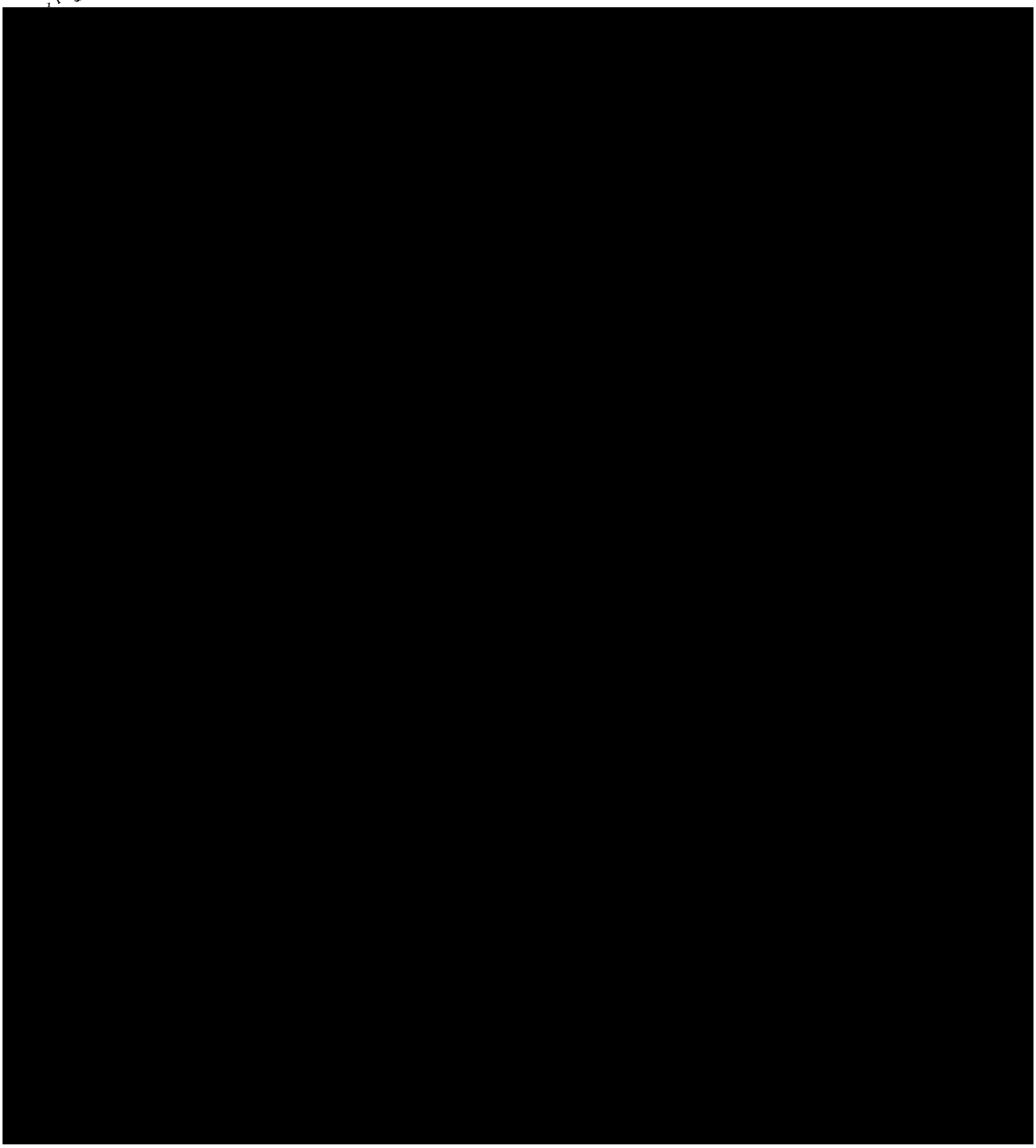

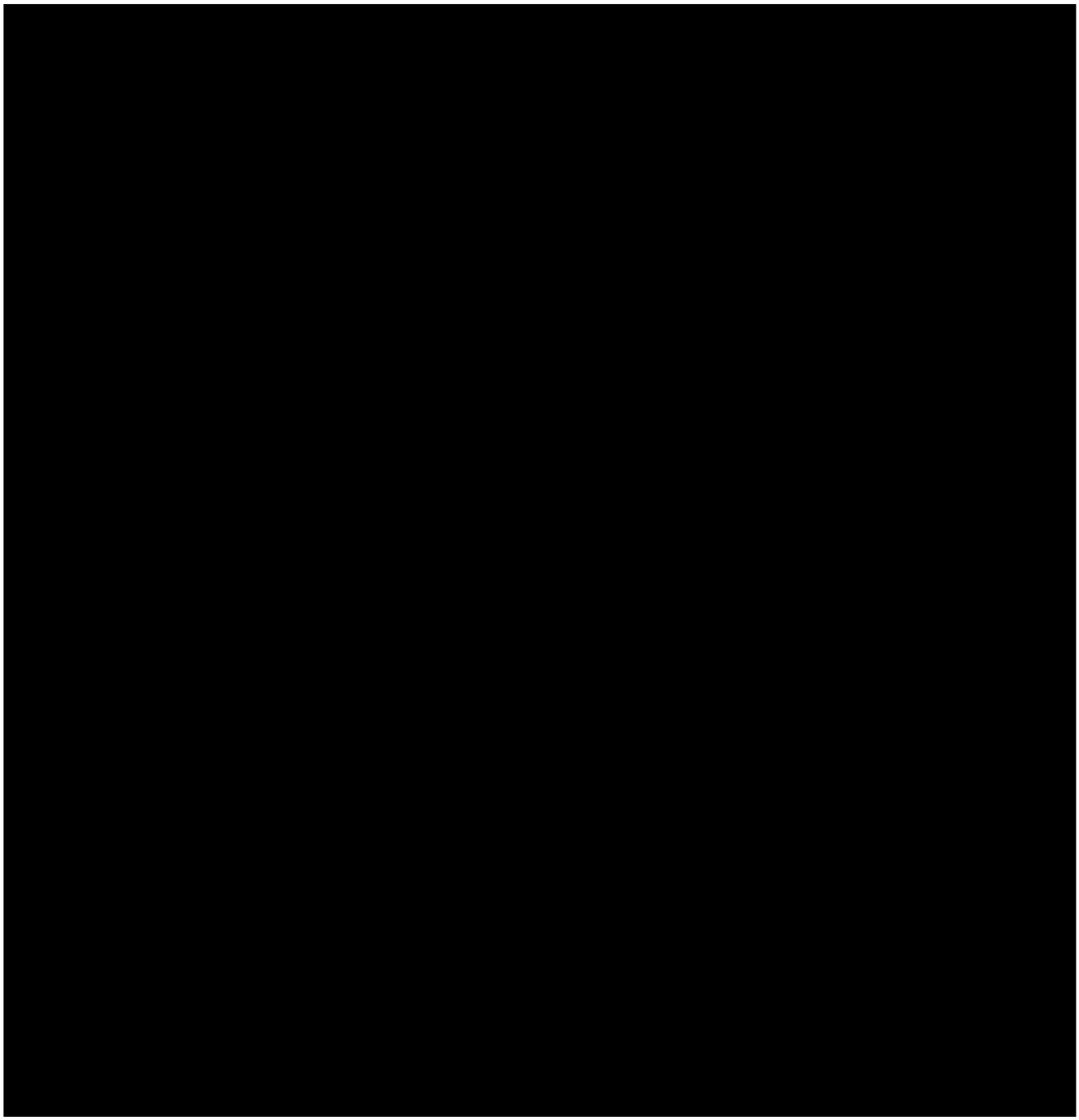

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